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EXAMINER

DOAN, PHUOC HUU

ART UNIT

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2617

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/696,988	Applicant(s) LI ET AL.	
	Examiner PHUOC H. DOAN	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28 and 29 is/are allowed.
- 6) ☒ Claim(s) 1-15, 19-21, 25-27 and 30-35 is/are rejected.
- 7) ☒ Claim(s) 16-18 and 22-24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 02/14/2008 have been fully considered but they are not persuasive.

Applicant argues, Eltawil does not disclose applying a delay to individual receive path in any rake finger operable to allow at least two signal to be distinguishable. Nor would introducing a delay in a rake finger have been obvious, because the intent of the Eltawil reference is precisely the opposite, to synchronize the signals. Eltawil therefore teaches away from introducing a delay operable to allow at least two diversity signals associated with the downlink signal to be distinguishable.

In response, claim does not recite such as “applying a delay to individual receive path in any rake finger operable to allow at least two signal to be distinguishable”. Claim recited “the delay operable to allow at least two diversity signals associated with the downlink signal to be distinguishable”.

Therefore, Eltawil discloses the delay operable to allow at least two diversity signals associated with the downlink signal to be distinguishable based on the same feature of ability to track the timing of a received multi-path signal and to adjust the rake finger’s timing for data recovery as the delay of the

assigned multi-path varies, that using estimates of the amplitude and phase of the three strongest path to be distinguishable the signals; multi-path included the delay, noise, etc...(See page 2, par [0014-0016]).

Applicant argues, Sourour does not teach introducing a delay in order to render two signals distinguishable.

In response, Sourour in combined with Eltawil and discloses the delay being less than one chip duration based on the selection channel to the chip duration of CDMA (See specification on pages 8-9). Sourour also discloses the delay being less than one chip duration, if multi-path diversity cannot be obtained because, for example, the delay spread of the signal is less than the chip duration (See col. 9, lines 11-14).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **1-15, 19-21, 25-27, 30-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Eltawil (US Pub No: 2003/0142726)** in view of **Sourour (US Patent No: 6,810,070)**.

As to **claim 1, 14, 20, 27**, Eltawil discloses a method for processing receive diversity signals (page 3, par. [0026]), comprising: receiving a downlink signal at a plurality of antennas of a mobile device (page 5, par. [0053]), the downlink signal comprising information (Fig. 2 with description); generating a plurality of diversity signals associated with the downlink signal (page 6, par. [0058]), each of the plurality of antennas operable to generate a diversity signal of the plurality of diversity signals (page 5-page 6, par. [0053-0058]); applying a delay to at least one of the plurality of diversity signals (page 2, par. [0015]); and processing the plurality of diversity signals using the delay to obtain the information (page 2, par. [0015-0016]), the delay operable to allow at least two diversity signals associated with the downlink signal to be distinguishable (page 2, par. [0014-0016]).

However, Eltawil does not disclose the delay being less than one chip duration.

In the same field of endeavor, Sourour discloses the delay being less than one chip duration (col. 9, lines 11-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the delay

being less than one chip duration as taught by Sourour to the system of Eltawil in order to select channel to the chip duration is used to determine the number of resolvable paths per carrier in a communication system.

As to claim 2, 8, 15, 21, Sourour further discloses the method of claim 1, wherein the delay comprises a delay of 0.4 to 0.8 microseconds (col. 9, lines 52-55).

As to claim 3, Eltawil further discloses the method of claim 1, further comprising summing the plurality of diversity signals after applying the delay to yield a combined signal comprising the delayed at least one of the plurality of diversity signals (page 7, par. [0066]).

As to claim 4, 11, Eltawil further discloses the method of claim 3, wherein processing the plurality of diversity signals to obtain the information further comprises: separating the combined signal in the time domain to yield a plurality of fingers (page 2, par. [0018-0019]), the plurality of fingers corresponding to the plurality of diversity signals (page 2, par. [0019]), at least one finger of the plurality of fingers comprising the delay (page 2, par [0016]); coherently combining the plurality of fingers to yield a combined symbol signal (page 2, par

[0018]), the combined symbol signal corresponding to the downlink signal (page 6, par. [0057]); and decoding the combined symbol signal to generate the information (See page 7, par. [0066]).

As to claim 5, 10, Eltawil further discloses the method of claim 3, further comprising converting the combined signal from analog mode to digital mode (page 4, par. [0041]).

As to claim 6, 13, Eltawil further discloses the method of claim 1, wherein generating the plurality of diversity signals further comprises filtering each of the diversity signals received from the plurality of antennas (page 5, par. [0047]).

As to claim 7, 26, Eltawil discloses a system for processing receive diversity signals (page 3, par. [0026]), comprising; a plurality of antennas operable to “Fig. 2, items 34, 36”: receive a downlink signal (Fig. 2 with description), the downlink signal comprising information (page 6, par. [0058]); and generate a plurality of diversity signal associated with the downlink signal (page 6, par [0058]), each of the plurality of antennas operable to generate a diversity signal of the plurality of diversity signals (page 5-page 6, par. [0053-0058]); and a processor “Fig. 2, item

60” coupled to the delay module and operable to process the plurality of diversity signals using the delay to obtain the information (page 2, par [0015-0016]), the delay operable to allow at least two diversity signals associated with the downlink signal to be distinguishable (page 2, par [0014-0016]). However, Eltawil does not disclose a delay module coupled to the plurality of antennas and operable to apply a delay to at least one of the plurality of diversity signals, the delay being less than one chip duration.

In the same field of endeavor, Sourour discloses a delay module coupled “Fig. 5, item 532” to the plurality of antennas and operable to apply a delay to at least one of the plurality of diversity signals “col. 9, lines 11-13”, the delay being less than one chip duration (See col. 9, lines 52-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the delay being less than one chip duration as taught by Sourour to the system of Eltawil in order to select channel to the chip duration is used to determine the number of resolvable paths per carrier in a communication system.

As to claim 9, Eltawil further discloses the system of claim 7, further comprising an antenna combiner “Fig. 2, item 84” operable to: sum the plurality of diversity signals after applying the delay; and yield a combined signal comprising the

delayed “related to multi-path” at least one of the plurality of diversity signals (page 7, par. [0066]).

As to claim 12, Eltawil further discloses the system of claim 11, wherein the processor comprises a baseband processor (digital signal processing DSP is required baseband process components, see page 5, par. 0047]).

As to claim 19, 25, Sourour further discloses the method of claim 14, wherein applying at least one delay to at least one of the plurality of split signals further comprises buffering the at least one of the plurality of split signals to introduce the at least one delay (col. 9, lines 10-40).

As to claim 30, Sourour further discloses the method of claim 1, wherein applying a delay to at least one of the plurality of diversity signals comprises applying a delay of between approximately 0.5 and one chip duration to at least one of the plurality of diversity signals (col. 9, lines 10-15).

As to claim 31, Sourour further discloses the system of claim 7, wherein said delay module is operable to apply a delay of between approximately 0.5 and one chip duration to at least one of the plurality of diversity signals (col. 9, lines 10-15).

As to claim 32, Sourour further discloses the method of claim 14, wherein applying at least one delay comprises applying at least one delay of between approximately 0.5 and one chip duration to at least one of the plurality of split signals to yield a plurality of distinguishable transmit diversity signals (col. 9, lines 10-15).

As to claim 33, Sourour further discloses the system of claim 20, wherein said delay module is operable to apply at least one delay of between approximately 0.5 and one chip duration to at least one of the plurality of split signals to yield a plurality of distinguishable transmit diversity signals (col. 9, lines 10-15).

As to claim 34, Sourour further discloses the system of claim 26, wherein said means for applying a delay comprises means for applying a delay of between approximately 0.5 and one chip duration to at least one of the plurality of diversity signals (col. 9, lines 10-15).

As to claim 35, Sourour further discloses the system of claim 27, wherein said means for applying at least one delay to at least one of the plurality of split signals

comprises means for applying at least one delay of between approximately 0.5 and one chip duration to at least one of the plurality of split signals to yield a plurality of distinguishable transmit diversity signals (col. 9, lines 10-15).

Allowable Subject Matter

3. Claims **28, 29** are allowed.

As to claim 28, the prior art of record in alone, or combination does not disclose a system for processing receive diversity signals, comprising; a plurality of antennas operable to: receive a downlink signal, the downlink signal comprising information; and generate a plurality of diversity signal associated with the downlink signal, each of the plurality of antennas operable to generate a diversity signal of the plurality of diversity signals; a plurality of filters, each filter of the plurality of filters coupled to an antenna of the plurality of antennas and operable to filter each of the diversity signals received from the plurality of antennas; a delay module coupled to at least one of the plurality of filters and operable to apply a delay to at least one of the plurality of diversity signals, the delay being less than one chip duration, the delay comprising a delay of 0.4 to 0.8 microseconds; an antenna combiner operable to: sum the plurality of diversity signals after applying

the delay; and yield a combined signal comprising the delayed at least one of the plurality of diversity signals; an analog-to-digital converter operable to convert the combined signal from analog mode to digital mode; and a processor coupled to the delay module and operable to process the combined signal using the delay to obtain the information, the delay operable to allow at least one multipath signal associated with the downlink signal to be distinguishable, the processor comprising a baseband processor, the baseband processor comprising: a rake receiver module operable to: separate the combined signal in the time domain to yield a plurality of fingers, the plurality of fingers corresponding to the plurality of diversity signals, at least one finger of the plurality of fingers comprising the delay; and coherently combine the plurality of fingers to yield a combined symbol signal, the combined symbol signal corresponding to the downlink signal; and a decoder coupled to the rake receiver module and operable to decode the combined symbol signal to generate the information.

As to claim 29, the prior art of record in alone, or combination does not disclose a system for processing a transmit signal, comprising: a splitter operable to: receive a transmit signal, the transmit signal comprising information; and split the transmit signal into a plurality of split signals; a delay module coupled to the splitter and

operable to: apply at least one delay to at least one of the plurality of split signals to yield a plurality of transmit diversity signals, the delay module comprising a buffer operable to introduce the at least one delay, the at least one delay comprising a first delay and a second delay, the first delay being less than the second delay; introduce the first delay at a first split signal of the plurality of split signals, the first delay comprising a delay in the range between 0.25 microseconds and five microseconds; and introduce the second delay at a second split signal of the plurality of split signals, the second delay comprising a delay in the range between 0.5 microseconds and ten microseconds; and a plurality of antennas operable to transmit the plurality of transmit diversity signals in order to process the plurality of transmit diversity signals, the transmit diversity signals comprising the information.

4. Claims **16-18, 22-24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 16, 22, the prior art of record does not disclose wherein: the at least one delay comprises a first delay and a second delay, the first delay being less than

the second delay; and the delay module further operable to: introduce the first delay at a first split signal of the plurality of split signals; and introduce the second delay at a second split signal of the plurality of split signals.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHUOC H. DOAN whose telephone number is 571-272-7920. The examiner can normally be reached on 9:30 AM - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VINCENT HARPER can be reached on 571-272-7605. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Supervisory Patent Examiner, Art Unit 2617

/PHUOC DOAN/
05/24/08